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62 separate items are enclosed

C8

MEMORANDUM FOR PR (Contractor/In-House Publication)

FROM: PROI (TI) (STINFO) 18 Apr 2000

SUBJECT: Authorization for Release of Technical Information, Control Number: **AFRL-PR-ED-AB-2000-076**
Christe, K.O., Wilson, W.W., Vij, A., Vij, V., Sheehy, J.A., Boatz, J.A., and Tham, F., "Use of Fluorine Chemistry for the Synthesis of Polynitrogen Compounds" (Abstract)

16th International Symposium of Fluorine Chemistry **(Statement A)**
(Durham, UK, 23 Jul 00) (Submission Deadline: 18 Apr 2000)

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PHILIP A. KESSEL Date
Technical Advisor
Propulsion Science and Advanced Concepts Division

Invited Keynote Lecture

Participant

USE OF FLUORINE CHEMISTRY FOR THE SYNTHESIS OF POLYNITROGEN COMPOUNDS

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Fluorine chemistry plays an important role in the synthesis of novel polynitrogen compounds. Thus, the reaction of $N_2F^+AsF_6^-$ with HN_3 in anhydrous HF solution has been shown to yield $N_5^+AsF_6^-$, a white solid that is marginally stable at room temperature and represents the first new stable homoleptic polynitrogen species in more than 100 years. We have now succeeded to prepare the $N_5^+SbF_6^-$ salt in high purity and yield and to record its complete vibrational spectrum. The compound is surprisingly stable, up to 70 °C, and exhibits little shock sensitivity. During attempts to recrystallize the compound from SO_2/SO_2ClF solutions, another new N_5^+ salt, $N_5^+Sb_2F_{11}^-$, was obtained and its crystal structure was determined. The V-shaped configuration and the bond lengths and angles, predicted for N_5^+ by our previous theoretical calculations, were confirmed. The reaction chemistry of N_2F^+ salts with other hydrogen containing species will be briefly discussed.